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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BALL, JOHN C	

ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/540,975	MURATA, KIYOHITO	
	Examiner	Art Unit	
	J. CHRISTOPHER BALL	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 June 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 June 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Summary

1. This Office Action based on the Amendment and Remarks filed with the Office on June 17, 2008, regarding the MURATA application filed with the Office on June 27, 2005.

2. Claims 1-10 are currently pending and have been fully considered.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Both Claims 1 and 2 recite a "value of rigidity" or "rigidity value" of various components. Rigidity is an inherent characteristic, not a variable characteristic to be set at a highest or any level. The instant specification does not teach or suggest how one of skill in the art would obtain a numerical value for rigidity of any of the components in the claimed invention. In its commonly understood definition, rigidity is defined as resistance to change, which could encompass many characteristic that could measured for the components (e.g., tensile strength, Young's modulus, heat capacity, etc.), and therefore the way in which

the term is recited in Claims 1 and 2 renders these claims indefinite. The substance with the highest rigidity has been interpreted to mean the substance which has the greatest qualitative hardness when comparing two or more substances with the same thickness or volume.

Claims 3-10 are rejected as being dependent on rejected Claims 1 or 2.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-4, and 8-10 rejected under 35 U.S.C. 103(a) as being unpatentable over KATSUMI et al. (Japanese Patent Publication H11-122960, A).

KATSUMI et al. discloses an exhaust heat electrical generating apparatus comprised of a thermoelectric converting unit that converts thermal energy of

exhaust gas into electrical energy (element 33 in Drawing 2), a heat exchange unit (elements 21 and 19 in Drawing 2) on one surface of the thermoelectric converting unit to conduct thermal energy from the exhaust gas that follow through an exhaust pipe (paragraph [0015]), and a cooling unit on the other surface of the thermoelectric converting unit (element 13a in Drawing 2), which are limitations recited in Claim 1. KATSUMI et al. does not specifically recite compositions of material for the thermoelectric converting unit, the heat exchange unit, or the cooling unit to make an explicit determination that the cooling unit has the highest rigidity among these components. However, KATSUMI et al. does teach that the heat exchange unit can be fabricated from a number of metals (paragraph [0063]). From this teaching, it would be obvious to one with ordinary skill in the art that the heating unit could be made of a material with less rigidity than the cooling unit, and that the typical material utilized to fabricate the thermoelectric conversion unit, semiconductor material, would also be less rigid than the material composing the cooling element. This would be obvious to do since a more rigid cooling unit would allow better attachment to the thermoelectric converting unit, resulting in a more compact exhaust heat power generating unit (paragraph [0075]). The result of this would be the cooling unit has the highest rigidity among the group of the cooling unit, thermoelectric converting unit, and heat exchange unit, which is a limitation recited in Claim 1.

KATSUMI et al. teaches a heat exchange unit that includes a heat exchange fin for collecting the thermal energy of the exhaust gas (element 21 in Drawing 2)

and a base (element 19 in Drawing 2) having one surface (element 19a in Drawing 2) attached to the heat collected fins (i.e., the heat exchange unit) and the other surface is in contact with the thermoelectric converting unit, which are limitations recited in Claim 2. KATSUMI et al. also teaches the exhaust pipe includes a main body that forms a frame of an exhaust passage, which is the inner shell (element 19 in Drawings 2 and 3), which is the base of the heat exchange unit, and the heat exchange fins are disposed therein (element 21 in Drawings 2 and 3); therefore, exhaust passage is constructed by the exhaust pipe and the heat exchange unit as they are one and the same (element 19 & 21 in Drawings 2 and 3), which are limitations recited in Claim 2. KATSUMI et al. teaches that heat exchange fins and base component are manufactured in the described embodiment from stainless steel (paragraph [0063]), but one of ordinary skill in the art would recognize that the heat exchange unit components can be fabricated from a number of different metals, including those that were less rigid than stainless steel (paragraph [0063]). Therefore, one skilled in the art could produce a base which is constructed from the most rigid material of all said components, which is a limitation recited in Claim 2. This would result in a sound interface between the heat exchange unit and the thermoelectric conversion unit, enhancing the heat transfer from the former to the latter.

KATSUMI et al. teaches the main body of the exhaust pipe, i.e., the inner shell (element 19 in Drawings 2 and 3) can be formed from a number of metals to address thermal conductivity (paragraph [0063]), and therefore could be chosen

to be constructed of a material with a thermal expansion ratio lower than the other component of the heat exchange unit, namely the heat collection fins (element 21 in Drawings 2 and 3). The main body of the exhaust pipe manufactured in the described embodiment from stainless steel (paragraph [0063]). These are limitations recited in Claims 3 and 4, respectively.

KATSUMI et al. teaches a configuration of the exhaust heat electrical generating apparatus where the heat exchange fins are configured in a plurality where some of the fins are disposed 180 degrees from each other (elements 21, 21a, and 21b in Drawings 3-7), i.e., they are disposed at a different pitch, which is a limitation recited in Claim 8.

KATSUMI et al. teaches that the heat exchanging fins (elements 21, 21a, and 21b in Drawings 3-7) can consists of two kinds of stainless steel plates (paragraph [0053]) that would inherently exhibit different heat conductivities, which is a limitation recited in Claim 9.

KATSUMI et al. teaches the main body of the exhaust pipe, i.e., the inner shell (element 19 in Drawings 2 and 3) and the heat exchange fins (element 21 in Drawings 2 and 3) can be formed from a number of metals and/or ceramic, so to address endurance, thermal conductivity, and heat deformation (paragraph [0063]). Therefore, it would be obvious to one of ordinary skill to choose construction material to give a configuration where the heat exchange unit (i.e., heat collection fin) deformation would be in an opposite direction from an exhaust

pipe deformation to keep proper spacing for heat exchange, which is the limitation recited in Claim 10.

8. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over KATSUMI et al. (Japanese Patent Publication H11-122960, A) as applied to claims 1-4 and 8-10, and further in view of KAZUHIKO et al. (Japanese Patent Publication H11-036981, A).

KATSUMI et al. discloses an exhaust heat electrical generating apparatus that recites the limitations of Claim 2 as stated above. KATSUMI et al. also teaches the exhaust pipe in the center of the apparatus (Drawing 2), the thermoelectric converting unit on the outer periphery of the heat exchange unit attached to the main body of the exhaust pipe (Drawing 2), and the cooling unit on the outer periphery of the thermoelectric converting unit (Drawing 2), which are limitations recited in Claim 5. KATSUMI et al. teaches the thermoelectric unit is formed by a plurality of thermoelectric units (element 33 and all like unlabeled elements, Drawing 2), which is a limitation recited in Claim 6.

KATSUMI et al. does not teach an elastic member on the outer side of the cooling unit, an elastic system, a unit of elastic system structured based on the thermoelectric module, nor that the elastic member includes a spring and a compression member which are one of in point contact and line contact with each other.

However, KAZUHIKO et al. discloses an exhaust heat power generating device, wherein is taught elastic members on the outer side of the cooling unit (elements 100 and 110 in Drawing 7) and these members are part of a system for fixing the thermoelectric converting unit by applied pressure to the cooling unit externally by the elastic member (paragraph [0051]), which are limitations recited in Claim 5. KAZUHIKO et al. also teaches the elastic system is structured based on the module of the thermoelectric converting units as evidenced in Drawings 6 and 7, where elements 10b, 11b, 100b, and 110b represent "breakthroughs" corresponding to the plurality of thermoelectric elements, which is a limitation recited in Claim 6. KAZUHIKO et al. also teaches the elastic member includes a spring material and compression member in contact (paragraphs [0051] - [0053]), which is the limitation recited in Claim 7.

KATSUMI et al. and KAZUHIKO et al. are analogous art, in that they deal with the same technology area, thermoelectric exhaust gas power generators.

At the time of the present invention, it would have been obvious to one of ordinary skill in the art to modify the exhaust heat electrical generating apparatus of KATSUMI et al. with the elastic system elements of KAZUHIKO et al. because to do so allows any thermal expansion to be eased (KAZUHIKO et al., paragraph [0051]).

Response to Arguments

9. Applicant's arguments, see page 9, filed June 17, 2008, with respect to the drawings have been fully considered and are persuasive. The objection of the drawings has been withdrawn.

10. Applicant's arguments filed regarding the rejection based on 35 U.S.C. 112, second paragraph have been fully considered but they are not persuasive. The change in the claim language introduced by the Amendment does not obviate the indefinite meaning of the claim. Rigidity is not a taught as an objective characteristic, therefore the relative comparisons as claimed can not be made by a person of ordinary skill in the art.

11. Applicant's arguments filed regarding the rejection based on 35 U.S.C. 103(a) have been fully considered but they are not persuasive. The reliance upon the prior art not teaching the limitation as introduced by the Amendment is moot since the limitation does not render the claim definite as to the metes and bounds of the claims. Therefore, the limitations have the same patentable weight as the original claim language and the prior art rejection still applies.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to J. CHRISTOPHER BALL, Ph.D. whose telephone number is (571)270-5119. The examiner can normally be reached on Monday through Thursday, 8:00 am to 5:00 pm (EDT).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JCB
AU 1795
08/14/2008

/Kaj K Olsen/
Primary Examiner, Art Unit 1795
August 18, 2008